

Message Text

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CORRECTED COPY (PARA 5 LINE MISSING)

E.O. 11652:ADS - DECLASSIFY UPON COMPLETION OF NEGOTIATIONS

TAGS:OCLR, TSPA, BR, CA, PE

SUBJECT:SATELLITE COMMUNICATIONS TECHNOLOGY (SATCOM) -
PROJECT 1227
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1. THE USAF HAS A REQUIREMENT TO CONDUCT TESTS OF SATELLITE
COMMUNICATIONS TECHNOLOGY IN ORDER TO FURTHER DEVELOP THE
CAPABILITIES OF AIRCRAFT AVIONIC EQUIPMENT FOR RELIABLE
WORLDWIDE SATELLITE COMMUNICATIONS SYSTEMS. IN ORDER TO
ACCOMPLISH THIS, THE USAF PROPOSES TO DEPLOY A SPECIALLY
EQUIPPED C-135B (BOEING 707 TYPE) WHICH HAS SEVERAL ADVANCED

DEVELOPMENT MODEL SATELLITE AIRBORNE TERMINALS WHICH OPERATE IN THE ULTRA, EXTRA AND SUPER HIGH (UHF, EHF AND SHF) FREQUENCY SPECTRUMS. REQUEST EMBASSIES SEEK APPROVAL OF RESPECTIVE HOST GOVERNMENTS FOR THE OPERATIONS DETAILED BELOW.

2. IN ORDER TO FURTHER DEVELOP THE CAPABILITIES OF AIRCRAFT AVIONICS EQUIPMENT FOR RELIABLE WORLDWIDE COMMUNICATIONS VIA SATELLITES, UNDER USAF PROJECT 1227, A C-135B (BOEING 707 TYPE) AIRCRAFT HAS BEEN EQUIPPED WITH SEVERAL ADVANCED DEVELOPMENT MODEL SATELLITE COMMUNICATION (SATCOM) AIRBORNE TERMINALS DEVELOPED FOR THE EHF (KA BAND), SHF (X BAND), AND UHF. FLIGHT TESTS ARE REQUIRED TO DETERMINE THE NEW EQUIPMENT'S CAPABILITIES AND LIMITATIONS, AND TO ASSURE THAT

MAXIMUM COMMUNICATIONS RELIABILITY AND PERFORMANCE RESULT FROM THE NEW DESIGNS BEFORE PRODUCTION. THESE TESTS MUST BE GLOBAL

IN SCOPE TO ALLOW EVALUATION OF THE NEW SATCOM EQUIPMENT UNDER A WIDE RANGE OF ELEVATION ANGLES, DOPPLER FREQUENCY SHIFT RANGES, AND PROPAGATION PATH CONDITIONS. THE ROUTE IS CAREFULLY PLANNED TO PROVIDE THE REQUIRED VARIETY OF CONDITIONS. THE RANGE OF ELEVATION ANGLES TO BE TESTED DICTATES TRANS-OCEANIC FLIGHTS DIRECTLY UNDER VARIOUS SATELLITES AND AT EXTREME RANGES FROM SOME SATELLITES. THE RANGE OF DOPPLER SHIFTS TO BE

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TESTED DICTATES THE SELECTION OF SOME FLIGHT HEADINGS AND TIMES OF DAY. PROPAGATION MULTIPATH CONDITIONS TO BE TESTED REQUIRE FLIGHTS AT LOW SATELLITE ELEVATIONS OVER LAND, SEA, AND ICE.

3. DURATION OF STOPOVERS IS DICTATED NOT ONLY BY CREW REST REQUIREMENTS, BUT ALSO BY EXTENSIVE PRE- AND POST-FLIGHT TEST EQUIPMENT CALIBRATION AND CHECKOUT, PLUS LOCAL FLIGHTS AND GROUND TESTS IN SOME AREAS OF INTEREST. TESTING UNDER WORST CASE PROPAGATION CONDITIONS ALSO REQUIRES FLIGHTS IN ARCTIC AND EQUATORIAL REGIONS TO OBSERVE EFFECTS OF IONOSPHERIC DISTURBANCES AND SCINTILLATION. IN EQUATORIAL REGIONS, BOTH BRAZIL AND PERU HAVE EXCELLENT SCIENTIFIC FACILITIES IN GROUND STATIONS FOR MONITORING THE CONTINUALLY MOVING AND CHANGING IONOSPHERIC DISTURBANCES. WITH THEIR DIFFERENT VANTAGE POINTS, FIXED GROUND STATIONS AND MOBILE AIRBORNE PLATFORMS OFFER COMPLEMENTARY DATA BASES WHICH TOGETHER CAN CONTRIBUTE TO A GROWING UNDERSTANDING OF IONOSPHERIC PHENOMENA AND ITS EFFECT ON COMMUNICATIONS SYSTEMS.

4. SPECIFICALLY IN THESE FLIGHTS, DATA WOULD BE GATHERED

ON THE COMMUNICATION PERFORMANCE DEGRADATION IN NEW SATCOM AIRBORNE TERMINAL EQUIPMENT, PLUS ADDITIONAL SAMPLES OF BASIC DATA ON THE VARYING NATURE OF THE IONOSPHERIC CONDITIONS, PLUS EFFECTIVENESS TESTING OF A NEW MULTIPATH DIVERSITY ANTENNA TECHNIQUE DESIGNED TO MITIGATE IONOSPHERIC DEGRADATION OF SATCOM PROPAGATION LINKS. A REQUEST FOR SCIENTIFIC GROUND STATION SUPPORT FOR ALL SOUTH AMERICAN FLIGHTS WOULD BE FORWARDED TO THE BRAZILIAN AND PERUVIAN SCIENTIFIC INSTITUTIONS WHO HAVE CONTRACTS WITH THE AIR FORCE GEOPHYSICS LABORATORY.

5. IN BRAZIL, IONOSPHERIC MONITORING SUPPORT WOULD BE REQUIRED FROM THE GROUND STATION AT NATAL. THE 6 HOUR LOCAL TEST FLIGHT PLANNED IN BRAZIL WOULD BE TOWARD AND
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ALONG THE ANDES, TO INVESTIGATE IONOSPHERIC EFFECTS OF THE SUSPECTED ANDES UPLIFT. THE PLANNED 6 HOUR FLIGHT FROM BRAZIL TO PERU WOULD BE A ZIG-ZAG COURSE FOLLOWING THE SUNSET INOSPHERIC EFFECTS. TESTING OVER BRAZIL WILL BE CONDUCTED ON BOTH FLIGHTS. IN PERU, A 6 HOUR LOCAL FLIGHT IS PLANNED TO PASS OVER THE OCEAN AND THE SUPPORTING GROUND STATIONS AT ANCON AND HUANCAYO. ALL SOUTH AMERICAN TESTS WOULD BE FLOWN AT SUNSET TO MAXIMIZE IONOSPHERIC EFFECT OBSERVATIONS. PERFORMANCE OF BOTH TRANSMITTING AND RECEIVING SATELLITE COMMUNICATION LINKS FROM THE AIRCRAFT TO AN AIR FORCE GROUND TERMINAL IN THE U.S. WILL BE RECORDED SIMULTANEOUSLY IN SEVERAL DIFFERENT FREQUENCY BANDS TO ALLOW COMPARISON OF RELATIVE PERFORMANCE CHANGES. FREQUENCY REQUESTS WOULD BE SUBMITTED THROUGH NORMAL CHANNELS IN ACCORDANCE WITH AFM 100-31.

6. THE AIRCRAFT WOULD ADHERE TO THE FOLLOWING SCHEDULE
(ALL TIMES Z, ALL DATES SEPTEMBER 78):

DEPART---LOCATION----- ARRIVE

12/1200 WPAFB
13/1800 THULE AB, GREENLAND ----- 12/1800
15/1200 MILDENHALL AB, UK ----- 14/0130
17/1800 ASCENSION ----- 15/2100
19/2100 GALEAO ARPT, BRAZIL (RIO) ---- 17/2330
21/2100 GALEAO ARPT, BRAZIL ----- 20/0301
22/2300 JORGE CHAVEZ INTL, PERU (LIMA) 22/0301
24/2300 JORGE CHAVEZ INTL, PERU ---- 23/0501
----- WPAFB, OH 7----- 25/0700

NOTE: DUE TO THE TECHNICAL NATURE OF THIS PROJECT THESE DATES ARE TENTATIVE. CHANGES WILL BE FORWARDED AS SOON
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AS POSSIBLE. -

7. TESTING WILL BE CONDUCTED ENROUTE FROM WPAFB TO THULE AB, GREENLAND, WHILE OVER CANADA. TESTING WILL ALSO BE CONDUCTED ENROUTE FROM THULE AB, GREENLAND, TO MILDENHALL AB, UK, WHILE OVER GREENLAND. ONLY PASSIVE TESTING WILL BE CONDUCTED FOR THE BRIEF PERIOD OF TIME NECESSARY FOR THE AIRCRAFT TO TRANSIT LAND CROSSING FROM THE PACIFIC TO THE CARIBBEAN ENROUTE FROM PERU TO WPAFB ON THE RETURN LEG.

8. OBSERVERS MAY BE ABOARD THE AIRCRAFT ON MISSIONS FROM LIMA AND RIO DE JANEIRO ONLY SINCE THESE ARE THE ONLY FLIGHTS THAT ORIGINATE-AND TERMINATE IN THE SAME COUNTRY. TOURS OF THE AIRCRAFT BY INTERESTED HOST OFFICIALS AT THESE AND OTHER LOCATIONS COULD ALSO BE ARRANGED WITH PRIOR NOTICE.

9. NORMAL CREW COMPLEMENT WILL BE EIGHT OFFICERS, FOUR ENLISTED, THREE DOD CIVILIAN, AND FOUR CIVILIAN CONTRACTORS.

ALL WILL BE U.S. CITIZENS AND WOULD POSSESS ALL IDENTIFICATION CREDENTIALS SPECIFIED BY THE USAF FOREIGN CLEARANCE GUIDE.

10. FOR COPENHAGEN: THIS PROJECT HAS BEEN APPROVED BY DANISH AUTHORITIES THROUGH THE ANNUAL SCIENTIFIC PROJECT APPROVAL PROGRAM. VANCE

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